Science, Technology and Energy Policy Programme

Annual Report, F.Y. 1983/84

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PREFACE

The following report was presented to Social Sciences Division during its annual staff meeting on May 1984. The purpose of the report is to present the work of the Unit in the context of the Centre's objectives and activities and aid in an evaluation exercise to be carried out. A similar report was first prepared for 1983/84.

The report was principally written by the acting Associate Director in consultation with other program colleagues. The section on Energy Policy was written largely by Andrew Barnett. The Associate Director is responsible for the contents and the points of view expressed in the following pages.

Section I deals with Science and Technology Policy support and Section II with Energy Policy; they are discussed separately in order to clarify the evolution of the two program perspectives. The two perspectives are administratively and operationally integrated and program officers work in all aspects of the Science, Technology and Energy Policy (STEP) program.

INTRODUCTION

1. The Science, Technology and Energy Policy Programme Unit is in one sense an administrative experiment within the Social Sciences Division. The professional staff of the Unit administer two different research areas supported by the Centre, though often interrelated in themes, methods and so on. The first is the more established programme of research in Science and Technology Policy issues which has been area of research support from the time of establishment of the Centre. The second area of research supported by the Unit staff is in the more recently established research programme in Energy Policy. Historically some research projects in the energy policy area received support within the STP programme for a number of years. Now it has grown in activities with the new Centre wide mandate for support for research on energy issues. Even though there is a separate budget allocation for the energy policy research programme it was decided at the beginning of 1983 to integrate the administration of the two research areas to the maximum extent possible. This has been done with the aim of achieving some benefits of economies of scale and to improve the utilisation of the most scarce resource of the Centre, namely, the available time of professional manpower. This has proved quite successful and will be continued in the near future until greater manpower resources or other factors suggest that two independently run programmes will be more desirable.

2. In the subsequent pages, the programme activities in Science and Technology Policy and Energy Policy are discussed separately.

TABLE 1

SCIENCE AND TECHNOLOGY POLICY

SUMMARY OF PROJECTS, DAPS AND FUNDS ALLOCATED BY STEP UNIT, 1983/84

	New Projects	Supplements	$	DAP	$(000)
Science & Technology Policy	18	7	2.0100 mn	23	138
Energy Policy	6	1	0.685 mn	9	90
INNRI*	6	-	1.100 mn	3	--
	30	8	3.800 mn	35	228

* INNRI is a separate category of Divisional funds for institutional support and for support of important research issues which fall outside existing categories.

TABLE 2

SCIENCE & TECHNOLOGY POLICY RESEARCH SUPPORT

1971-1984

Fiscal Year	Total Approp.for Sector	% of Division Approp.	# of New Projects for Sector	# of New Projects in Division	Average Value for Project for Sector
71 - 72	166,000	24.4	2	18.2	83,000
72 - 73	51,400	4.2	2	7.1	25,700
73 - 74	936,400	20.6	2	6.1	468,200
74 - 75	302,600	4.9	4	10.0	75,700
75 - 76	1,535,200	28.9	12	23.1	127,900
76 - 77	447,000	10.7	3	6.7	149,000
77 - 78	666,000	10.5	17	27.0	39,200
78 - 79	719,000	11.4	8	21.0	89,900
79 - 80	901,000	16.3	5	8.8	180,200
80 - 81	1,407,000	17.7	21	19.9	68,600
81 - 82	1,615,770	18.2	17	15.3	97,900
82 - 83	2,042,200	17.8	18	15.7	113,500
83 - 84	2,010,000	15.1	17	13.3	113,900

TABLE 3

SCIENCE AND TECHNOLOGY POLICY: PROJECTS BY REGION

Region	FY 1982-83					FY 1983-84				
	Approp. $	% over Approp. Unit	% over Approp. Region(d)	New Proj. N	Avg. Value of Project $	Approp. $	% over Approp. Unit	% over Approp. Region(d)	New Proj. N	Avg. Value of Project $
Asia	189,000	9.3	9.4	3	63,000	106,300	5.3	3.9	1***	106,300
Africa	619,100	30.3	21.6	7	103,200	113,100	5.6	4.5	3	37,700
Canada	-	-	-	-	-	-	-	-	-	-
Latin Am. & Caribb.	1,115,300	54.6	18.6	8	123,900	1,114,000	55.4	17.7	10	111,400
M. East	-	-	-	-	-	30,000	1.5	6.2	1	30,000
Global	118,800	5.8	26.8	0*	-	646,600	32.2	48.6	2	323,300
Total	2,042,200	100.0	-	18**	113,500	2,010,000	100.0	-	17	118,200

* No new projects
** In addition, 7 supplements
*** In addition, 3 supplements
(d) Calculated on the basis of total appropriations in the region by Division

I. SCIENCE & TECHNOLOGY POLICY

i) The Principal Issues

3. All research supported by the programme rest on certain beliefs and assumptions. The central one is a corollorary to the historically observed phenomenon that in the developed countries a process of continual technological changes has contributed predominantly to the increase in production and wealth. In comparision to technological advance, which very broadly signifies the improvements in tools, methods and organisation of production, the contribution from increased use of capital or labour has been less significant. This is seen from separate enterprise level studies, sector wide studies of resource use and also in macroeconomic studies. The belief is that it is important for the developing countries to use improved technologies within their own economies and that greater policy attention needs to be focused on the processes of acquisition, development, adaptation and diffusion of improved technologies as a major tool for development.

4. From this simple statement stems the many complex questions to which detailed answers need to be provided for useful decisions to be made. One set of questions relate to national efforts at developing and utilizing technology; questions which have to do with the amount of resources which need to be allocated, the sectoral shares, the organisation of the national technological effort, its distribution among educational institutions, dedicated research institutions, private versus public, linkages to production units and so on.

5. Another set of questions arises from the fact that the bulk of new scientific and technological developments, between 85-95%, depending on the source, continue to take place in industrialized countries. Hence, for a long period the developing countries have to acquire most technologies developed and used in

other economies and environments. This raises the issues of costs of acquisition, efficiencies of different modes of technology acquisition, their impact on domestic efforts, the effects of such dependency and a host of legal, contractual, social and cultural issues. Within this subset of issues a new set of questions is of growing interest. With the relative success of a small group of developing countries, labelled the newly industrialised countries (NICS), in attaining certain levels of indigenous technological capability important new questions emerge. These include studies to explain the relative success of some countries against others and whether key ingredients can be identified and imitiated by others. Others include a comparison of NICS as new technology suppliers as against the traditional sources.

6. The programme has for the past few years defined its support for research into four main areas: first, resource allocation and national policies for science and technology; second and third, technical change in two sectors, manufacturing and agriculture; and finally, an area focused on small scale industry and technologies which often support and are used by large numbers of poorer people.

7. The activity of the programme is to a large part dictated by the nature of issues which need to be addressed. On one hand, science and technology policy is not an accepted discipline where one can easily turn to the acknowledged custodians of knowledge to define the boundaries of the field of enquiry. In fact its' importance as an area of research stems from the fact that issues of technology play a significant, sometimes major role in all socially useful activities whether in education, health, manufacturing, agriculture, trade and so on. Even in activities less useful socially, as in military expenditures and warfare, technology has a major symbiotic relationship. Further, there continues to be rapid growth of the scope and knowledge in sciences and technologies. For an understanding of the issues and suitable policy formulation no single discipline contributes fully but there is a need for inputs from

economics, sociology, law and so on. If there is a pattern in the projects supported by the programme, it rests on the belief that the project defines a problem area within which technology policy issues are important. Further that the problem can be illuminated by such research, the researchers are relatively open to different sides of the problem and as far as individual and institutional constraints allow, are able to bring the most relevant disciplinary knowledge into the research.

8. Science and technology policy remains a relatively amorphous subject both in terms of theory and practice. There is no overall theoretical edifice comparable to that on which many other disciplines rest nor are there many teaching programmes or research institutions devoted solely to the issue. What exists is a body of evidence that in certain circumstances, specific policies and situations relate in a given set of ways to create more or less desirable outcomes. For most governments and ministries technology policy is a second order issue dependent on the solution of more pressing first order problems of political authority, security, balance of payments, fiscal policy, employment and inflation, approximately in that order. When first order problems are not seen to be enormous, there is some encouragement to technology policy in speeches or planning documents, supporting either indigenous, more efficient or energy saving technologies. Still in the day to day routine of administration, its role is minimal and as crises approach, the small support is often threatened. It is an aim of the research supported by the program to demonstrate the links between the first order and second order problems, and how they shape and constrain one another.

9. Finally, the program views that the technology issues are important enough to need studies to deepen our understanding of these issues. At the same time, neither technology, policy nor development can operate in isolation of economic, social, cultural, political and other factors.

ii) Science and Technology Policy Projects

10. The following section lists the projects to which funds were made available during the year. The first category includes the projects which needed supplementary allocations above the amounts originally budgeted. The second category, the more important one, lists the new projects supported by the programme in 1983-84.

Supplements

11. The projects which were supplemented in this fiscal year are listed below in Table 4.

TABLE 4

SCIENCE AND TECHNOLOGY POLICY: SUPPLEMENTS

		Officer	Amount($)
80-0196	Technological Responses to Rising Energy Prices - Thailand	HK	14 000
80-0200	Technological Capacity in Chemical Sector - Bangladesh	AR/HK	13 900
81-0047	Employment Policy & Technical Change - Colombia	ADT	5 500
81-0221	Technology & Female Employment in Leather Goods Sector - Uruguay	ADT	7 700
82-0003	Choice of Technique in Spinning & Weaving - Bangladesh	AR/HK	14 775
83-0010	Technology, Employment & Education - Uruguay		
83-0068	Popularization of Science - Ethiopia	EMR	10 000
	TOTAL		72 550

12. In the first five supplements approved, the reason for the supplement was to cover the additional time required to complete the project. In three cases the extensions of time were small in comparison with the total durations of the projects which were between two to three years. In two cases, the original estimates for completion of the work were eight and ten months respectively. In such tightly organized projects, minor disruptions to the work schedule translates into considerable impact on the completion of the work. Three cases illustrate problems faced by more inexperienced researchers estimating the time required more accurately. Often due to a lack of local resources researchers hope that a study can be completed in a shorter time than is realistic. A difference in the supplements of 1983-84 from the previous year was that they represented less than 4%, (19%) of the appropriations, freeing $1.94 million ($1.46 million) for new activities.

New Projects

13. The annual and four year program of work sets out the themes of research supported by the unit and this has been discussed earlier. The title, locations and the amount of Centre funds provided to new projects is provided in Table 5 below. This is to followed by a brief description of the projects.

TABLE 5

SCIENCE AND TECHNOLOGY POLICY: NEW PROJECTS IN 1983-84

Project No.	Title	Country	P. Off.	Amount
3-P-83-0010	Technology, Employment and Education	Uruguay	ADT	$ 23,650
3-P-83-0017	Technology and International Investments by Small Firms	Argentina	ADT	89,000
3-P-83-0067	Technology, Employment, Education and Development	E. Africa	ADT/SS	73,900
3-P-83-0068	Popularization of Science	Ethiopia	EMR	30,000
3-P-83-0131	Pharmaceutical Marketing Practices	Malaysia	CCS	63,660
3-P-83-0162	The Developments in Micro-Electronics and their Impact	Argentina	AR	96,400
3-P-83-0174	Postgraduate Engineering Apprenticeship Schemes	Kenya	EMR	18,800
3-P-83-0189	The Status of Science and Technology	Botswana	CCS	21,000
3-P-83-0190	Technology Transfer Contracts	Ghana	CCS	25,300
3-P-83-0197	Technology Assimilation & Adaptation in Steel & Aluminium	Venezuela	EMR	82,000
3-P-83-0198	The Impact of Computer Technology	Chile	ADT	96,800
3-P-83-0207	Scientific Communities in Chile: Case Studies	Chile	ADT	98,600
3-P-83-0237	Developments in Microelectronics and their Impact	Global	AR	570,000
3-P-83-0249	Technology Policy (Central America) - Phase II	C. America	ADT	511,400
3-P-83-0279	Information Technologies & Cultural Policies	Peru	EMR	64,000
3-P-83-0332	Evaluation of Science & Technology Decision Making	Peru	ADT	86,800
3-P-83-0334	Juxtaposition & Comparison of Tech. Transfer Experiences	Guyana	EMR	25,000
3-P-83-0345	Technology Policy Workshop Dissemination Phase	Global	CCS	76,600
3-P-83-1009	Schooling, Cognition and Work	Global	EMR/AB	85,000
			TOTAL	$2,137,910
			Total Number of New Projects	19
			Average Budget per Project	$ 112,520

14. Resource Allocation. The unit supported three studies in this category. One supports a very small initiative in Botswana ($21,000) to determine the uses of and the resources allocated for science and technology in the country. The second study in Peru ($75,000) supports Science and Technology Council (Peru) CONCYTEC to examine in detail all processes and mechanisms which influence the decision-making process, analysis of current funding patterns and responsibilities of different institutions in the field of science and technology. The third study reviews the developments in two science professions in Chile ($98,600), for a total support in this category of around $200,000.

15. Technical Change, Manufacturing Sector (Policies and Impacts). This area received the maximum support in the year 1983-84. There are 3 projects on technological developments and national policies relating to specific sectors. One relates to computers (Chile), and others look more broadly in the field of microelectronics in Argentina, India, Brazil, Mexico and South Korea. Two, there is also a project which examines the technology transfer and domestic capacity development in Steel and Aluminum (Venezuela) where Indian, Brazilian, Mexican roles as technology suppliers will be a part of the focus. A study on pharmaceuticals production and distribution and multinational practices (Malaysia) is one that was jointly developed and funded with the Health Sciences Division. A third area includes a study in the broad area of costs and regulations in technology transfer was supported to allow the Ghana Investment Centre to examine the nature of technology transfer contracts entered into by Ghanian companies with foreign suppliers and also to compare the costs and features of such contracts with the results of another study ongoing in Tanzania, as well as the records of the national registries in India and Mexico. The fourth study in this area looks at the experience of Argentina and Brazil in technology transfer agreements with small international firms as against the large dominant MNCs. A fifth project supports an interesting study in Guyana which will compare the experience and costs and benefits of three industrial plants set up

with Indian and Chinese technology suppliers versus similar plants set up with large industrial country technology supplier.

16. As noted in the program of work and budget, an important area of research supported by the program is on the impact of radical new technologies on developing countries. Within this, the issues related to the impact of microelectronics based technology developed for over two years has culminated this year with project identification meeting and projects developed in Argentina, Brazil, India, Mexico, and South Korea. For the meeting the programme produced a review of existing research on the impact of microelectronics on developing countries and the currrent trends in the industrialized countries. This will be updated during the project and made available to the researchers. A more narrowly focussed study within this is the project in Chile examining the impact of computer technology.

17. Three out of the seven supplements also relate to projects on technical change in the manufacturing sector which are examining textiles, chemicals and leather goods respectively. All together the project activities related to studies on the industrial sector accounted for almost half of the project documents and an allocation of eleven hundred thousand dollars. A natural concern for the future is to avoid overlap and confusion between this established area of Centre support and the new program area of industrial policy.

18. Technical Change, Employment and Education. Changes in employment patterns, technology, education and skill requirements is a problem area of focus that has been jointly developed by this program in collaboration with the Education program of the Division. This has resulted in support for a meeting followed by an experimental project in East Africa. A meeting was also successfully held in India. All three activities have been held jointly with the Education programme. Some projects which have been supported under this theme include one in Uruguay (3-P-83-0010) and

one in Kenya (3-P-83-0174) which examines the scheme for engineering apprenticeship in Kenya. The total funds spent in these three projects was $90,000. The meeting in Latin America had to be postponed for a number of months and will take place in May 1984.

19. Communications and Information Technology. There was one study in Peru on Information Technologies Policies (3-P-83-0279) which was supported ($75,000).

20. Other. A number of projects did not fall clearly into one of the above categories but had some overlap between categories. These include first, a project in Ethiopia with the Science and Technology Commission which sets out to examine the nature of popular and traditional beliefs in Ethiopia in order to develop appropriate programs for the popularisation of science. A second project which may be placed here is actually a large network project in Central America which looks at overall issues in technology policy, and undertakes case studies of policies in certain agricultural commodities and manufacturing. Thus it can be included in any one of three categories. The project also has a substantial dissemination and training component ($550,000).

Divisional Activity Projects

21. The program supported 23 activities under this category. Partial support was provided for a UN meeting on the implications of new technologies in Africa. The remaining activities were more directly in support of the program's own work.

22. Four meetings were organised by the Program to review and disseminate research findings or to discuss proposals for future research support. These include the review of research on peasant technologies; education, science, technology and employment (India); technology policy (West Africa); impact of microelectronics (Mexico).

23. The program supported eight consultancies to provide inputs to research meetings, to develop new research projects and to guide the directions of its future work. These are:

1. Local Technology and Employment Creation (G. Vittelli)

2. Current Social Science Research in Central America (E. Martinez)

3. Review of Research on Impact of Microelectronics on Developing Countries (E.D. Leppan)

4. Status of University Based Social Sciences Research (Africa)(N. Kostiuk)

5. Employment Generation Policies (Latin America) (R. Lagos)

6. Technology Policy for Small Island States (A.J. Dolman)

7. Software Exports from developing countries (R. Chopra)

8. Development Banks, Industrialization Strategies and Technology Policy - Review of Research (E.D. Leppan)

24. And the remaining 10 activities provided travel support to researchers supported by the program to participate in workshops and seminars to present their work, and to visit other researchers and institutions doing similar research.

Publications

25. Some of the reports of research supported by the Program are being published this year. The following are being published by the Centre. These are mainly from the Caribbean Technology Policy Studies Phases I and II, the last one is from the project on Rural Technology and Education in Colombia.

1.	Norman P. Girvan	Technology Policies for Small Developing Economies: A Study of the Caribbean
2.	Jeffrey W. Dellimore and Judy A. Whitehead	Secondary Agrobased Industries
3.	Maurice A. Odle and Owen S. Arthur	Commercialization of Technology and Dependence in the Caribbean
4.	Steve DeCastro	Caribbean Petrochemicals: Industrial and Technological Issues
5.	Raj K. Bardouille	Technological Capability in the Caribbean Bauxite Industry
6.	Trevor M.A. Farrell and A. Mel Gajraj	Vehicle Assembly in Trinidad-Tobago

7.	L.B. Coke, P.I. Gomes and A.M. Gajraj	The Agriculture Sector and Environmental Issues
8.	C. Thomas	The Threat and the Promise: An Assessment of Technological Changes and Impact on Sugar producing economies
9.	F. Arbab	FUNDAEC: Experiment in Rural Education and Technology

Issue for the Coming Year

26. It will be seen from Table 2, the programme has supported 79 projects between 1980-81 and 1983-84. Of these 19 projects were completed during the last year. These projects, together with some of the consultancies supported by the programme have resulted in 59 reports. It is our view that adequate attention has not been provided so far to the objective of dissemination of the results. So far the unit has encouraged final workshops with policymakers and researchers where the results warrant and has encouraged the publication of a small subset of the research output. The first challenge for the programme will be to review, comment and participate in workshops and seminars with the same degree of personal commitment as earlier.

27. A strategy which will be tested in the coming year will be to make greater use of IDRC manuscript series for the dissemination of the research results. It has been found that a number of reports do not even get published either because the English is poor, the size of the study too large or that adequate commercial markets do not exist. It is hoped that by providing some editorial support, a much larger number of studies can be disseminated more widely for appropriate policy impact.

iii) Important Activities for the Next Year

28. The series of four workshops on Science & Technology Policy have been concluded in this fiscal year. The workshops have been monitored and evaluated from the beginning with the close cooperation of the Office of Planning & Evaluation and guided by a Centre wide advisory committee. It is gratifying to note that all the evaluations carried out of the activity have been uniformly positive. For the time being, the emphasis is to make edited versions of the research reviews and lecture notes of the workshop more widely available to researchers and policy makers.

29. There are new demands on the programme to do more exercises of a similar nature. Possibilities include similar exercises in other regions, national workshops and/or shorter/more focused exercises. The need for such workshops and for greater efforts at the dissemination of research results supported by the unit is acutely felt by the professional staff. These receive regular reinforcement as the staff continually turn down requests of project proposals from researchers, governments and other agencies which demonstrate great ignorance of the existing body of knowledge. But with the departure of two members of the unit staff, one to return to research and the other to the fellowships division of the Centre, the Unit does not expect to be able to take any major new workshop initiatives in the coming year.

30. As a result of the workshops, there has been an increased interest in research in Science and Technology Policy issues in the regions. This interest has been nurtured through a nationally and regionally coordinated network of small studies in East Africa. The experience in that exercise has been promising. It is expected that the East African network will be supported for another phase. Also, a similar exercise is likely to be supported in West Africa. A coincidental bonus to the studies and workshops supported in the Caribbean is the recently expressed interest in the Ministry of Science and Technology in Jamaica to make use of these studies in formulating national policies, an activity in which the programme may participate.

31. Finally, if professional staff time permits, besides the development and support of initiatives developed in the past, the questions of resource allocation to science and technology and the set of issues related to indicators of national scientific and technological efforts, and outputs, will receive a fresh look through research supported by the programme.

II. ENERGY POLICY RESEARCH SUB-PROGRAMME

i) Overview

32. The year has seen many activities within the programme come to fruition after a number of years of project development. the process of project development has been far slower and far more labour intensive than we had hoped or expected. Furthermore, the policy of systematically reviewing energy policy research in specific countries has also begun to produce results. More generally, as the needs of governments to respond to problems in the energy sector as a crisis, has receded, the opportunity to undertake more serious research has become more possible. The year has also seen the development of a greater consensus among practitioners about what needs to be done, with an emphasis on actions in the medium to long term future.

33. Before turning to the specifics of the programme, there are three general considerations which influence our research funding strategy. First, there are considerable amounts of money, particularly from the aid community though sometimes from national governments, for research in the energy sector of developing countries. For instance, ESCAP has estimated that considerably more than $60m is currently allocated to energy research in their region. (They were, however, unable to obtain expenditure data on many of the projects they identified). Furthermore, national governments have also massively increased the allocation of local resources to energy research. India (a country for which fairly good data are

easily available) has allocated $128.87m to energy research in the period 1980-85. But it is important to examine these data more closely to determine whether IDRC's very modest funds can play a role. While the huge effort that India is making is undeniable, it must be recognised that this is less than 1% of the local resources being allocated by government for investment in the energy sector ($15,000m for the five year plan period). Furthermore these R&D figures include activities in all energy sectors including oil exploration and generally emphasizes hardware development rather than policy research.

34. With aid funds, closer examination shows that much of the money is for Technical Assistance and for "quick and dirty" consultancies (which rely on secondary sources of material as is the case with the much acclaimed World Bank/UNDP country assessments). Much of the remaining money also goes to hardware development. But perhaps most important from IDRC's point of view, aid funds are largely devoted to ideas and initiatives from the donor countries.

35. Data on Energy R&D tend not to provide the detail necessary to form the basis for a precise policy response by IDRC or anyone else. In particular, it is difficult to determine the local content of the research, who controls the research, who actually carried it out and whether it makes any contribution to the building of local capability. On the basis of what we know, we strongly believe there is a role for IDRC support which stresses policy analysis (rather than exclusively technical research), which stresses local control and capability development in research, and which stresses the ability of developing countries to make independent choices.

36. A second factor which influences our judgement is the changing climate for energy policy research in many countries. Many people believe that the climate for all forms of research is worse now than even five years ago. The energy policy area seems to have particular problems of sensitivity and changing fashions in resource

allocation in a number of countries. This is especially so in two of the countries that we have given special attention in 1983/84 - Indonesia and Philippines. In many countries there appear to be a number of specific sensitivities: for instance, alcohol fuels in Kenya and data collection on the rural energy situation in India. Such sensitivities understandably reduce researchers' willingness to propose research and have slowed the rate of development for certain projects while researchers negotiate government clearances.

37. The third consideration that influences us is the continued methodological weakness of many proposals that we receive and the inability of researchers to build on earlier research carried out by others. This requires us to devote a great deal of time and more funds to "front end" activities (consultancies, meetings of researchers and policy makers, the development of networks, the strengthening of reviews to consolidate and develop research methods for specific problems). It also suggests a greater need to assist in obtaining, reviewing and disseminating literature. In this respect, it is perhaps useful to note John Hardie's recent review of S&T projects in Korea in which the "front-end" project development costs and investments of staff time were considerable for what was then the relatively new field of S&T research.

ii. Energy Policy Projects

38. Seven projects were funded in the year for a total commitment of $514,100. (See Table 6 below). In many cases, these projects were the fruition of project development that started two or three years ago. Broadly speaking the projects fell into four of the five areas we have stressed in the past: namely, energy surveys (China), planning (Seychelles and the North East of Brazil), the management of supply and demand (Costa Rica - transport, Brazil - large energy supply projects) and Reviews (Turkey). The fifth sector, Technology Assessment, will be the subject of a major initiative in 1985.

39. The year also saw the commitment of seven DAPs ($77,170). (See Table 6 below). There were for travel support (to attend the International Association of Energy Economists Conference, to attend Energex, and to review training possibilities); one was for a project identification meeting in Southern Africa; and there were three reviews (Indonesian Energy Policy Research, Energy Planning Models for Micro-Computers and Latin American Rural Energy Surveys).

40. The strategy to determine the current energy policy research and needs in particular countries or particular topics was continued. Seven major reviews were undertaken in specific countries or regions. These were Turkey (by project), Indonesia, India and S.E. Asia (by DAPs one of which was commissioned by Dr. Pande), Sri Lanka, North East Brazil, Philippines (by programme officers), and Southern and Eastern Africa (by PIM). During the year, the results of the rural energy survey methodological review were also received.

TABLE 6

ENERGY POLICY RESEARCH, 1983-84: PROJECTS AND DAPS

A. Projects FY 1983/84

3-P-83-0077	Turkey Energy Policy Review	$ 28,800
3-P-80-0196(S)	Technological Responses to Rising Energy Prices (Thailand)	14,000
3-P-83-0247	Energy in the Transport Sector (Costa Rica)	96,800
3-P-83-0253	Impact of Large Energy Projects (Brazil)	94,000
3-P-83-0292	Rural Energy Planning (Brazil)	96,300
3-P-83-0301*	Energy Planning (Seychelles)	97,200
3-P-83-0341*	Urban Energy Use Survey (China)	87,000
	Total	$514,100

B. DAPS

3-A-83-4152	Teri Travel Support	$ 10,700
3-A-83-4206	Rural Energy Survey Review (L.America)	3,800
3-A-83-4222	Energy Policy Research Survey (Indonesia)	3,900
3-A-83-4229	Energy Planning Model Review	7,100
3-A-83-4232	Travel Support IAEE	13,090
3-A-83-4304	PIM Energy Policy Research (Harare)	16,400
3-A-83-4310	Travel Support Energex (Canada)	22,180
	Total	$ 77,170

* These two projects and two DAPS are funded from SGBA Energy funds.

iii. Major Activities for 1984-85

41. Given the weak methodological base of much of the research in the area of rural energy mentioned earlier, decision has been taken to develop a major network in the area of rural energy technology assessment. This will develop a consensus about the methods for the comparative social and economic evaluation of the technologies. This will be set in the context of what is known about the needs and demands of rural populations that has been determined by earlier research. It will also respond to the demand from policy makers for advice about the production, diffusion and further development of the technology. This project, which is described in greater detail elsewhere, will be developed in two phases. The first, which will start in 1985, will establish the major research issues and determine how they might be researched. It will also nurture a network of between 5 and 10 research groups that would be able to participate in the second 'field work' phase of the project.

iv. The Energy Research Group

42. STEP continues to have administrative responsibility for this major Centre initiative in which a group of emminent researchers and policy makers from developing countries will try to develop a consensus about research needs in the energy sector. We believe that the project has made a good start in this task.

43. A major feature of the year will be the production of some 114 reports commissioned by ERG. These reports provide a valuable input to the work of the sub-programme but the evaluation of these and other output of ERG and the consideration of a supplemental will place a considerable demand on Program Officers' time.

v. Style of Programme Development.

44. Given the shortage of experienced staff during the coming year, the sub-programme wishes to seek the continued assistance of regional offices and the hiring of local consultants. We would see the continued emphasis on reviews of specific countries to be a cornerstone of the energy program development. These reviews are best undertaken by nationals of these countries and will cover current and planned energy policy research, local literature, the assessment of institutional capability, and the consolidation of research results on particular topics.

vi. Coordination.

45. The issue of coordination has arisen at many points during the last year (and during the Staff Meeting). It cannot be said that the donor agencies have shown great competence in this area. In the International donor community, for instance, the UN (through Mr. Harland's office) have recently published a listing of all energy research funded by the UN system. This shows dupliction of effort even within the UN system. In one mechanism to reduce this dupliction, the donor community has called upon IDRC to arrange the Second Informal Meeting of Energy Research Donors. This meeting is expected to take place in Ottawa in September 1984 and will be administered by STEP.

46. Within the Centre, co-ordination of energy related activities continues to absorb a considerable amount of staff time. These issues have become most critical in relation to rural fuels particularly those associated with woody biomass and small-scale renewable energy technologies. AFNS, Energy Policy, Economics and possibly Health Sciences (health effects of smoke) are involved in these areas.

III. OTHER ISSUES

i. Relations with Other Divisional and Centre Activities

47. In the research areas in Science and Technology Policy, the unit has been in close contact with the Information Sciences Division in a project on computer conferencing in Mexico and Brazil carried out by CREALC, the Latin American regional office of the IBI. The project has been completed and the report provides a useful analysis of the communications infrastructure of the two countries. It is likely that in the next year, the two divisions will jointly respond to further requests from CREALC.

48. There is a joint project with the Health Sciences Division studying pharmaceuticals in Malaysia and close interaction continues in proposals which can benefit from a combined approach. Similarly in the three currently ongoing projects on agricultural technology, discussions and interchange with AFNS staff are maintained.

49. Interchange, discussions and feedback is much greater with all Centre programmes in the Energy Policy area. This is both necessitated and facilitated by the coordinating role of the Internal Energy Committee chaired by Mr. J.H. Hulse, the Vice President (Research).

50. Within the Division, aside from participation in various normal divisional activities, a formal area of research has been explored over the past year with the education programme. This concerns issues where the interlinkages between Technology, Education and Employment are critical. The two programmes have supported three regional meetings on these issues in Delhi, Nairobi and Chile. The proceedings of each of the workshops will be published shortly. There continue to be a number of joint projects with the Economics programme and this pattern will continue.

ii. Demands on and services provided by the Programme

51. The number of projects, supplements, DAP documents processed and the funds disbursed are the most visible indicators of the progrmme's output. In the process of developing projects, a large number of informal and formal discussions and requests are processed by the Unit. Only those requests which seem potentially serious and meet various programme and Centre criteria for possible support are recorded in a potential projects file. The unit added 225 new potential projects files in the current year. Of these, 55 or approximately 25% were developed into some form of Centre support, varying from travel/meeting support and fellowships to consultancies and projects.

52. The unit currently looks after the needs of 62 active projects. Given that it has initiated approximately eighteen to twenty new projects a year, it operates approximately on a three year cycle. Besides the programme related activities the unit administers on behalf of the Division funding support provided to 17 institutions and associations under the INRRI budget category.

iii. Programme Evaluation

53. It was a stimulating experience for the programme to be involved in the recent board evaluation of the Division's activity. It was a great encouragement to the work of the programme staff to participate in a critical exchange of views, to discover the great interest of the board members in its work and to receive many useful comments and suggestions. The unit is grateful to Dr. Lawless, Dr. Aida, Dr. Nettleford and Dr. Urquidi for their time and for their many useful comments.

54. The programme has on its own initiative begun discussions in the past year with the Office of Planning and Evaluation for an indepth review of its activities. There have been a number of fruitful exchanges, the preparation of this report being one of

them. On the other side, Mr. Hardie of OPE spent a week in Korea taking a look at and discussing with all Korean researchers supported by the Unit. His evaluation report from that exercise provides welcome confirmation of the value and usefulness of the activities supported by the programme. It also draws out some lessons relevant to the Unit and the Centre as a whole. It is expected that some time during the coming year, the focus of such an evaluation can be specified more clearly with feedback from the ongoing exercise of the Division and the Education programme, and, that a major evaluation of the Unit's work will be available in 1985.

iv. Staff

55. The unit has an allocation of six professional staff, Chris Smart, Eva Rathgeber, Amitav Rath, A.D. Tillett, H. Krugmann and Andrew Barnett. Of these the first four have primary responsibilities for the areas of research support in Science and Technology Policy and the last two in Energy Policy. In practice, each member of the professional staff has fully participated in the work of both programme areas. Due to the illness of the Associate Director, A.D. Tillett, the unit had A. Rath as acting Associate Director for the year. The output of the unit is a result not only of the inputs of the professional staff but also the very dedicated and professional support provided by Helene Charlebois, Doris Ngiam and Julia Trudel.

56. A. Perez provided valuable support to the work of the Unit in Central and Southern America during the absence of Mr. Tillett. Finally, due recognition must be given to the important project support provided by J. Campbell and A. Schwenk on the Technology Policy Workshop series which is now drawing to an end after the series of four workshops

57. For the coming year, the programme can expect some disruption in its work with the departure of two senior staff

members. Chris Smart has been appointed Associate Director, Fellowship Division. His substantive knowledge, combined with his experience in Africa and of the very successful series of Technology Policy Workshop will be hard to replace. In the interim, the bulk of the Units work in Africa will be handled by Eva Rathgeber.

58. Another concern is to minimise the disruption to the Program following Andrew Barnett's departure from the staff at the end of 1984, and Andrew will be hard to replace. A major exercise is also underway to find a new Program Officer who has experience in energy policy research. Our earlier efforts in recruitment in this field suggests that the process will be time-consuming. In the meanwhile, Amitav Rath will take on formal responsibility for coordinating all energy policy research support of STEP. The contribution to the Program that Dr. Hartmut Krugmann has made over the last year (particularly with his knowledge of Brazil and the more scientific aspects of energy development) suggests that great care and the allocation of considerable amounts of staff time to the recruitment process are well justified and unavoidable.

59. It is hoped that the rising momentum of the energy policy programme can be maintained during the year despite the staff changes. The integration of the Energy Policy Research Program within the Science and Technology Policy Program has produced major dividends in terms of increasing the effectiveness of staff time for the monitoring of projects and in optimising the travel budget.